

IN THE CLAIMS

This listing of claims replaces all prior listings and versions of the claims in the present application.

Listing of Claims:

Claim 1 (Currently Amended) An electronic component holding head for holding an electronic component to be mounted to a substrate, comprising:

a main electronic component holding unit~~[[; a]]~~ said main electronic component holding unit having vacuum chucking ~~part~~holes provided ~~on said main electronic component holding unit~~ so as to face the surface of the electronic component to be held by vacuum chucking, so that the electronic component is held by vacuum chucking to said main electronic component holding unit; and

a light path part provided in the main electronic component holding unit, the light path part being configured to guide light shined onto a positioning mark formed at a terminal part of the electronic component to correct a position offset between the electronic component and a substrate to which the electronic component is to be mounted, wherein said vacuum chucking ~~part holds~~holes hold the electronic component at a position which ~~covers~~ is on straight lines substantially parallel to edges of the electronic component respectively and substantially ~~mutually orthogonal~~perpendicular to the positioning mark of the electronic component, said vacuum chucking holes partially covering the electronic component, ~~said vacuum chucking part~~holes being located in a vicinity of the positioning mark and avoiding the positioning mark so as to hold substantially all portions of the electronic component in engagement with said main electronic equipment holding unit.

Claim 2 (Original) The electronic component holding head according to claim 1, further comprising:

a light source provided on said main electronic component holding head, which shines light toward the positioning mark formed on the electronic component held by said vacuum chucking part, via said light path part.

Claim 3 (Original) The electronic component holding head according to claim 1, wherein

said light path part is a rectangular solid cutout part at a corner of said main electronic component holding unit.

Claim 4 (Original) The electronic component holding head according to claim 1, wherein

said light path part is a tapered cutout part at a corner of said main electronic component holding unit.

Claim 5 (Original) The electronic component holding head according to claim 4, further comprising:

a light source provided on said main electronic component holding unit, which shines light toward the positioning mark formed on the electronic component held by said vacuum chucking part, via said light path part, wherein

an inclined surface of the cutout part is formed as a reflecting mirror surface, and light emanating from the light source is shined onto the positioning mark from the reflecting mirror surface.

Claim 6 (Original) The electronic component holding head according to claim 1,
wherein

said light path part is a through hole provided in said main electronic component holding unit, which opens toward the positioning mark of the electronic component.

Claim 7 (Original) The electronic component holding head according to claim 6,
wherein

said vacuum chucking [[part is]] holes are annularly formed around the outer periphery of the through hole.

Claims 8-14 (Canceled)

Claim 15 (Currently Amended) An electronic component mounting apparatus for mounting an electronic component onto a substrate, comprising:

an electronic component feeding unit, which feeds an electronic component;

an electronic component holding head, which holds the electronic component to be mounted onto a substrate;

an imaging unit, which forms an image of a positioning mark formed at a terminal part of the electronic component held by said electronic component holding head, for correcting a position offset between the electronic component and the substrate to which the electronic component is to be mounted;

a position offset detection unit, which detects a position offset of the electronic component relative to the substrate, based on image data of the positioning mark obtained by said imaging unit;

a position correction unit which, based on the position offset detected by said position offset detection unit, performs control so as to correct the X direction and the Y direction position offset of the electronic component relative to the substrate, so that the electronic component with the thus corrected position offset is mounted to the substrate, wherein

said electronic component holding head includes:

a main electronic component holding unit;

[[a]] vacuum chucking ~~part~~holes provided on said main electronic component holding unit so as to face the surface of the electronic component to be held by vacuum chucking, so that the electronic component is held by vacuum chucking to said main electronic component holding unit; and

a light path part provided in the main electronic component holding unit, the light path part being configured to guide light shined onto the positioning mark formed at a terminal part of the electronic component to correct a position offset between the electronic component and the substrate to which the electronic component is to be mounted, wherein

said vacuum chucking ~~part holds~~holes hold the electronic component at a position which ~~covers~~is on straight lines substantially parallel to edges of the electronic component respectively and substantially ~~mutually orthogonal~~perpendicular to the positioning mark of the electronic component, said vacuum chucking holes partially covering the electronic component, said vacuum chucking ~~part~~holes being located in a vicinity of the positioning mark and avoiding the positioning mark so as to hold substantially all portions of the electronic component in engagement with said main electronic equipment holding unit.

Claim 16 (Original) The electronic component mounting apparatus according to claim 15, further comprising:

a receiving stage onto which the electronic component fed from said electronic component feeding unit; and

a second imaging unit forms an image of the positioning mark of the electronic component placed on said receiving stage.

Claims 17-18 (Canceled)

Claim 19 (Currently Amended) A method of mounting an electronic component to a substrate, comprising:

feeding an electronic component;

forming an image of a positioning mark for compensation of a position offset between the electronic component and the substrate to which the electronic component is to be mounted;

detecting a position offset of the electronic component relative to the substrate, based on the image data of the positioning mark;

correcting the X direction and Y direction position offset of the electronic component relative to the substrate, based on the detected position offset; and

holding a position offset corrected electronic component by said electronic component holding head and mounting the electronic component to the substrate, wherein

said electronic component holding head includes:

a main electronic component holding unit;

[[a]] said main electronic component holding unit having vacuum chucking part-holes provided on said main electronic component holding unit so as to face the surface of the electronic component to be held by vacuum chucking, so that the electronic component is held by vacuum chucking to said main electronic component holding unit; and

a light path part provided in the main electronic component holding unit, the light path part being configured to guide light shined onto the positioning mark formed at a terminal part of the electronic component to correct a position offset between the electronic component and the substrate to which the electronic component is to be mounted, wherein said vacuum chucking ~~part holds~~ holes hold the electronic component at a position which ~~covers~~ is on straight lines substantially parallel to edges of the electronic component respectively and substantially ~~mutually orthogonal~~ perpendicular to the positioning mark of the electronic component, said vacuum chucking holes partially covering the electronic component, said vacuum chucking ~~part~~ holes being located a vicinity of the positioning mark and avoiding the positioning mark so as to hold substantially all portions of the electronic component in engagement with said main electronic equipment holding unit.

Claim 20 (Canceled)

Claim 21 (New) The electronic component holding head according to Claim 1, wherein said positioning mark comprises a plurality of positioning marks and wherein said vacuum chucking holes extend between adjacent positioning marks of said plurality of positioning marks.

Claim 22 (New) The electronic component holding head according to Claim 15, wherein said positioning mark comprises a plurality of positioning marks and wherein said vacuum chucking holes extend between adjacent positioning marks of said plurality of positioning marks.

Claim 23 (New) The electronic component holding head according to Claim 19, wherein said positioning mark comprises a plurality of positioning marks and wherein said vacuum chucking holes extend between adjacent positioning marks of said plurality of positioning marks.